

The Physiological Basis of Costs of Reproduction in *Drosophila melanogaster*

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Costs of reproduction, i.e., trade-offs between reproduction and other fitness components such as survivorship, are very common among organisms but their underlying mechanisms remain poorly understood. Physiologically, such trade-offs are often thought to arise from energetic investment into reproductive effort, away from resource allocation to somatic maintenance. The fruit fly, *Drosophila melanogaster*, is a powerful genetic and physiological model system to study the mechanistic underpinnings of the trade-off between reproduction and somatic maintenance. Physiological changes in lipid metabolism and immune response can be inferred through the analyses of patterns of gene expression – transcriptomic analyses.

By manipulating the reproduction, transcriptome analyses showed that germline-ablated flies (sterile) do not seem to suffer from the costs of reproduction compared to flies with an intact germline (fertile). Similar to previous studies in other insects and worms, germline proliferation trades off with lipid metabolism and immune response in *Drosophila*, and these trade-offs might be evolutionary conserved.

Jury:

Prof. Dr. Thomas Flatt (thesis supervisor)

Prof. Dr. Judith Korb (external co-examiner)

Prof. Dr. Bas Zwaan (external co-examiner)

Prof. Dr. Laure Weisskopf (president of the jury)